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23280 7590 03/13/2009

Davidson, Davidson & Kappel, LLC
485 7th Avenue
14th Floor
New York, NY 10018

EXAMINER

CADUGAN, ERICA E

ART UNIT

PAPER NUMBER

3726

DATE MAILED: 03/13/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/578,702

12/14/2006

Reinhold Meier

5038.1026

3881

TITLE OF INVENTION: MILLING TOOL AND METHOD FOR MILLING RECESSES

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	06/15/2009

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

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23280 7590 03/13/2009

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(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/578,702	12/14/2006	Reinhold Meier	5038.1026	3881

TITLE OF INVENTION: MILLING TOOL AND METHOD FOR MILLING RECESSES

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	06/15/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
CADUGAN, ERICA E	3726	409-132000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
- 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s); (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

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Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/578,702	12/14/2006	Reinhold Meier	5038.1026	3881
23280	7590	03/13/2009	EXAMINER	
Davidson, Davidson & Kappel, LLC 485 7th Avenue 14th Floor New York, NY 10018			CADUGAN, ERICA E	
			ART UNIT	PAPER NUMBER
			3726	
DATE MAILED: 03/13/2009				

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 164 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 164 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability	Application No.	Applicant(s)	
	10/578,702	MEIER ET AL.	
	Examiner	Art Unit	
	Erica E. Cadugan	3726	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment of 1/28/2009.
2. ☒ The allowed claim(s) is/are 26 and 28-32.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. <input type="checkbox"/> Notice of References Cited (PTO-892) 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | <ol style="list-style-type: none"> 5. <input type="checkbox"/> Notice of Informal Patent Application 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance 9. <input checked="" type="checkbox"/> Other <u>annotated drawing sheet</u>. |
|---|---|

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EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Sunil Raval on March 4, 2009.

The application has been amended as follows:

Claim 26 (currently amended): A method for milling circular recesses into a workpiece, comprising:

providing a milling tool, the milling tool including a base body and at least one cutting body having inside and outside surfaces with respect to the circular recess and situated on an outer periphery of the base body, the inside and outside surfaces of the at least one cutting body being angled away from the base body such that the at least one cutting body is angled away from a rotation axis of the milling tool, the base body being disk shaped or plate shaped, and wherein an inside radius of the inside surface of the at least one cutting body is greater than a radius of an inside surface of the circular recess; and

milling recesses into a workpiece with the milling tool;

wherein during milling, the rotation axis of the milling tool and a surface of the workpiece into which a circular recess is milled define a first acute angle, the surface of the workpiece into which the circular recess is milled being planar.

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Claim 28 (Currently Amended). The method as recited in Claim 26, wherein the first acute angle corresponds approximately to a second acute angle between [an] the outside surface of the at least one cutting body and a disk-shaped or plate-shaped surface of the base body.

Claim 29 (Currently Amended): The method as recited in Claim 26, further comprising:
calculating a suitable milling radius and a suitable angle between an outside of the cutting body of the milling tool and the disk-shaped or plate-shaped surface of the base body of the milling tool based on: a radius, a depth and a width of the circular recess to be milled; and a permissible tolerance for the recess.

Claim 30 (Previously Presented): The method as recited in Claim 29, wherein the tolerance includes a tolerance for a circular inner wall and/or a tolerance for a circular outer wall of the circular recess to be milled.

Claim 31 (Previously Presented). The method of claim 26, wherein the work piece is a gas turbine component.

Claim 32 (Previously Presented). The method of claim 26, wherein the milling step comprises reconditioning groove-shaped recesses on gas turbine components which are deformed.

Non-elected claim 33 has been canceled.

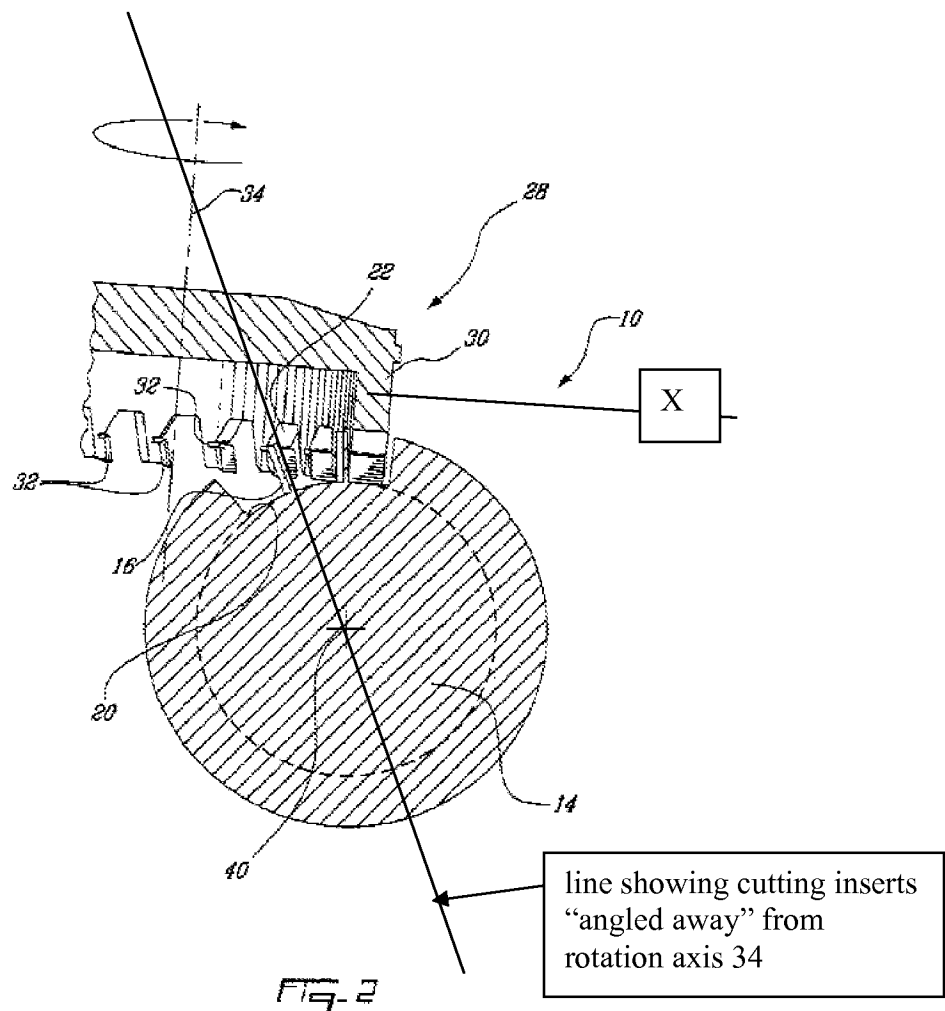
Non-elected claim 34 has been canceled.

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2. It is noted that non-elected claims 29-30 and 32 are allowable by virtue of their dependence on so as to include all limitations from allowable claim 26. Claims 29-30 and 32 are thus being permitted to be rejoined. (Claims 33 and 34 do not read on the embodiment now set forth in claim 26, noting that the specification as originally filed does not teach a method involving "milling flow channels between adjacent blades or for milling blade clearances during the manufacture of integrally bladed rotors of a gas turbine" as set forth in claim 33 or the step of "milling single-blade profiles for gas turbine blades" as set forth in claim 34, in combination with the method involving the milling of a circular recess into a workpiece, "wherein the surface of the workpiece into which the circular recess is milled being planar" as set forth in claim 26.)

3. The following is an examiner's statement of reasons for allowance:

U.S. Pat. No. 6,935,817 to Sasu was applied to various claims in the Office Action mailed October 24, 2008. However, even noting that the cutting inserts 32 are considered to be "angled away from a rotation axis" 34 of the milling tool, as shown below (in the reproduction of Figure 2), Sasu does not teach all aspects of the present invention as currently set forth in independent claim 26.



Firstly, note that in Sasu, the curved recesses (between blades 12) that are produced in the workpiece 10 are not milled into a "planar" surface of the workpiece 10 that defines any sort of "first acute angle" with the rotation axis 34 of the milling tool (see Figure 1, for example) as set forth in the last three lines of independent claim 26.

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Secondly, it is noted that as mentioned in the Office Action mailed 10/24/2008, the combination of cutting inserts 32 with their respective elements "X" as labeled in the above reproduction of Figure 2 can be considered to constitute "cutting bodies". That said, it is noted that the two generally vertical (vertical with respect to Figure 2) surfaces of the element X (X is labeled above) constitute the "inside and outside surfaces" (of the cutting body) with respect to the milled arcuate recess. Note that the inside and outside surfaces of the cutting body extend in the same direction as the rotation axis 34 of the milling tool, and thus, Sasu does not teach that the "inside and outside surfaces of the at least one cutting body" are "angled away from the base body such that the at least one cutting body is angled away from a rotation axis of the milling tool" as set forth in independent claim 26.

Also, there is no combinable teaching in the prior art of record that would, reasonably and absent impermissible hindsight, motivate one having ordinary skill in the art to so modify the teachings of Sasu, and thus, for at least the foregoing reasoning, Sasu does not render obvious the present invention as set forth in independent claim 26.

Additionally, GB 2276575 (GB '575) was applied to various claims in the Office Action mailed 10/24/2008.

However, as presently claimed, firstly, note that in GB '575, the curved recesses (between blades 16) that are produced in the workpiece 14 are not milled into a "planar" surface of the workpiece 14 that defines any sort of "first acute angle" with the rotation axis (such as 21 or 31) of the milling tools 20, 30 (see Figure 1, for example) as set forth in the last three lines of independent claim 26.

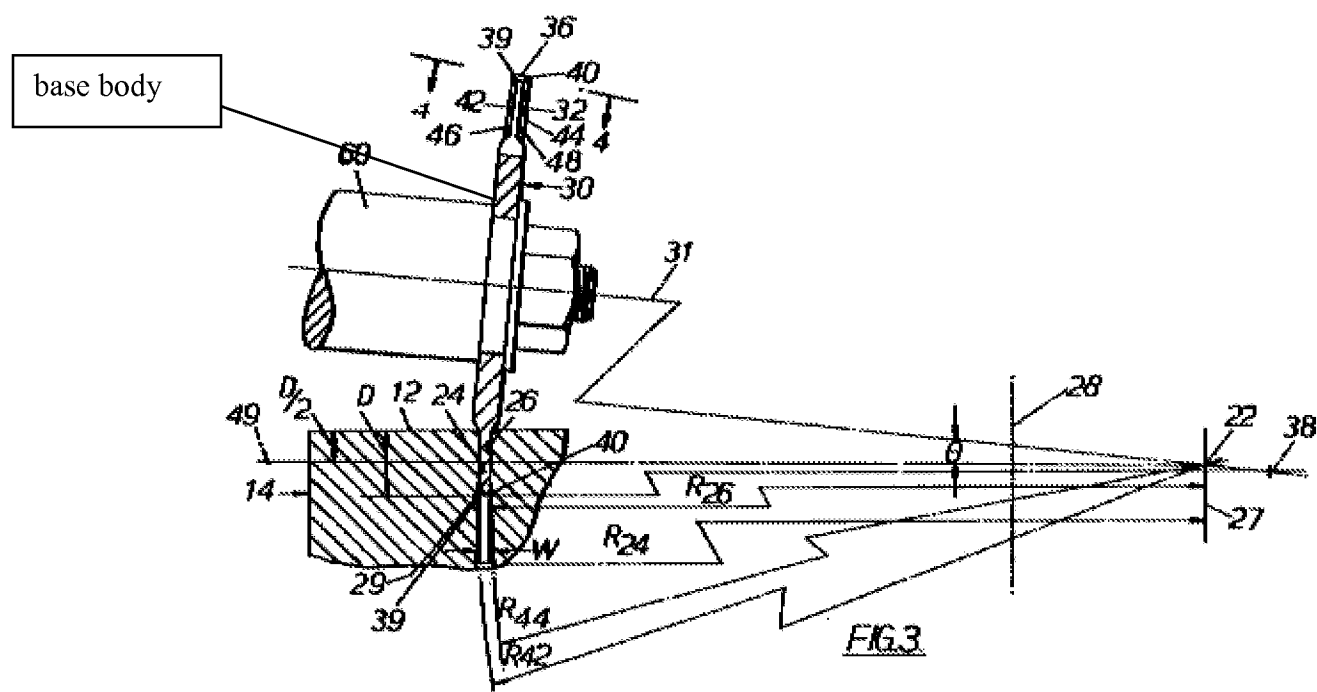
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Secondly, it is noted that the two generally vertical surfaces of the element described in the Office Action of 10/24/2008 as an “Example of a ‘cutting body’” (vertical is as viewed in Figure 1) constitute the “inside and outside surfaces” (of the cutting body) with respect to the milled arcuate recess. Note that the inside and outside surfaces of the cutting body extend in the same direction as the rotation axis (21 and/or 31) of the milling tool(s) (20, 30), and thus, GB ‘575 does not teach that the “inside and outside surfaces of the at least one cutting body” are “angled away from the base body such that the at least one cutting body is angled away from a rotation axis of the milling tool” as set forth in independent claim 26.

Also, there is no combinable teaching in the prior art of record that would, reasonably and absent impermissible hindsight, motivate one having ordinary skill in the art to so modify the teachings of GB ‘575, and thus, for at least the foregoing reasoning, GB ‘575 does not render obvious the present invention as set forth in independent claim 26.

Additionally, GB 1365439 (hereinafter GB ‘439) teaches a method for milling arcuate grooves 10 into workpieces 14 (Figure 1) with a milling tool 30 (Figures 2-3). The milling tool 30 includes a disk-shaped or plate-shaped “base body” at the central portion thereof as labeled in the reproduction of Figure 3 below.

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Additionally, the milling tool 30 includes “cutting bodies” in the form of teeth 32 (see at least Figure 2) having cutting edges 36, 42, 44 (see Figure 3). GB '439 explicitly teaches that the peripheral cutting edges 36 are formed to lie on a conical surface whose vertex 38 is intersected by the cutter rotation axis 31 (Figure 3, also page 2, lines 99-118, for example). GB '439 further teaches that the side cutting edges 42, 44 are parallel to one another (at least page 2, lines 125-127) and perpendicular to the peripheral cutting edges 36 (at least page 3, lines 15-27 and page 1, lines 54-62, for example), i.e., the side cutting edges 42, 44 are angled at a non-right angle with respect to the rotary axis 31 of the tool (in order to be perpendicular to the edge 36 that is angled relative to axis 31), see Figure 3.

The arcuate groove 10 being cut has an inside surface 26 (having a radius R26 shown in Figure 1) and an outside surface 24 (having a radius R24 shown in Figure 1), see Figures 1, 3.

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Thus, the inside cutting edge 44 and its surface and the outside cutting edge 42 and its surface are “angled away” from the base body such that the cutting bodies are “angled away” from the rotation axis 31 of the tool (see above description re angles of 36, 42, and 44).

Also, during milling, the rotation axis 31 of the milling tool and a planar surface 12 on the workpiece 14 into which the arcuate recess 10 is milled define a “first” acute angle θ , shown in Figure 3.

However, noting the relative size between the milling tools 30 and the workpieces 14 (see at least Figures 6-7), and particularly noting the relative size between the radii of the milling tools 30 and the radius R26 of the inside surface 26 of the arcuate recess 10 (see Figures 6 and 7), GB '439 does not teach that “an inside radius of the inside surface of the at least one cutting body is greater than a radius of an inside surface of the circular recess” as is set forth in present independent claim 26. (The present specification provides support for such a limitation in at least Figure 1 and on page 5, lines 1-2, noting that the radius RK1 is greater than RZ1).

Additionally, there is no combinable teaching in the prior art of record that would, reasonably and absent impermissible hindsight, motivate one having ordinary skill in the art to so modify the teachings of GB '439, and thus, for at least the foregoing reasoning, GB '439 does not render obvious the present invention as set forth in the above-proposed independent claim 26.

The aforescribed prior art being representative of the closest prior art of record, for at least the foregoing reasoning, the prior art of record neither anticipates nor renders obvious the present invention as set forth in independent claim 26.

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Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Drawings

4. The replacement drawing sheet submitted January 28, 2009 is approved.

Conclusion

5. Any prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erica E. Cadugan whose telephone number is (571) 272-4474. The examiner can normally be reached on Monday-Thursday, 5:30 a.m. to 4:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Bryant can be reached on (571) 272-4526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

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like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Erica E Cadugan/
Primary Examiner
Art Unit 3726

eec
March 9, 2009